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Cont

magnet yoke, a diaphragm that vibrates by magnetic action when a high-frequency current is applied and a vibration plate that vibrates by magnetic action when a low-frequency current is applied, with the coil positioned within the magnetic gap and the coil, the magnet, the magnet yoke, the diaphragm, and the vibration plate are accommodated in a basket, in which the coil is supported by a concentric projection that projects from the surface of the vibrating portion, and there is a diaphragm within the basket.

REMARKS

At the outset, the Examiner is thanked for the thorough review and consideration of the present application.

The Examiner's non-final Office Action dated October 9, 2001 has been received and its contents carefully noted. Claims 1-14 were pending in the present application. By this amendment, claims 1, 3, 8, and 10 have been amended. Accordingly, claims 1-14 remain pending, of which claims 1, 4, 5, 8 and 10-13 are independent. Claims 4-7 and 11-14 have been withdrawn from consideration.

Drawings

Figure 1 was objected to as failing to comply with 37 C.F.R. §1.84(p)(4). Figure 1 has been corrected to address the objection raised by the Examiner in the Office Action. Specifically, the support shown in Figure 1 on the left side of the Figure which is currently indicated with the reference numeral "10" has been changed to reference numeral "11a." This is consistent with the specification at page 4, line 7 and line 12. Please note, in the specification at page 4, line 12, the vibrating portion was incorrectly labeled 11a. The specification has been corrected such that vibrating portion 11a is now shown as 11b.

The drawings have also been objected to by the Examiner "because cut-away views of insulated portions, for example, 'basket body' 30 should be cross-hatched as such." The Applicants have again reviewed Figure 1 in light of the Examiner's objection. The Applicants believe that the Examiner has objected to the manner in which the basket body 30 has been cross-hatched in the section view in Figure 1. The Examiner is reminded that 37 C.F.R. §1.84(n) indicates that graphic drawing symbols and other labeled representations may be used for

conventional elements where appropriate, subject to approval by the Office. It is respectfully submitted that Figure 1 as presented is clear and unambiguous and further that one with ordinary skill in the art would know how to make and use the invention in light of the drawings and specification. If the Examiner has a specific objection as to the manner in which the cross-hatching has been shown in Figure 1, the Applicants welcome any such suggestions. The Applicants also wish to point out that due to the scale of the drawing in Figure 1, use of drawing symbols as presented in 37 C.F.R. §1.84(n) would not necessarily be practical.

Specification

The disclosure has been objected to due to an informality at page 3, line 24. Accordingly, in line 24, "Figure 8" has been corrected to read "Figure 9."

Claim Rejections - 35 U.S.C. §112

Claims 1-3 and 8-10 have been rejected by the Examiner under 35 U.S.C. §112, second paragraph, for indefiniteness. With respect to claim 1, line 2, "that forms," it is respectfully submitted that the language submitted in claim 1 is definite. Specifically, the magnet 20 forms a magnetic circuit between the N-pole of the magnet and the S-pole of the magnet. The magnetic circuit is formed as the magnet's flux passes magnet yoke 21. The basis for this feature is found in the specification at page 4, lines 18-20.

With respect to claims 1, 8 and 10, and the use of the term "impressed" in the claims, the Applicants have amended claims 1, 8 and 10 to recite "applied" instead of "impressed." The Applicants respectfully submit that the claims, as amended, are definite.

With respect to the specific position of the coil recited in claims 1, 8 and 10, the Applicants submit the following: The magnetic gap is a gap that is formed between magnet 20 and magnet yoke 21. Furthermore, coil 10 is mounted in the magnetic gap. Furthermore, this magnetic gap is shown in the drawings in Figure 1 as "G" and further shown in the specification at page 4, lines 25-28 and page 5, lines 3-11. Accordingly, the Applicants respectfully submit that the specification, drawings, and claims are definite with respect to the specific position of the coil.

With respect to the antecedent basis rejections in claims 1, 3 and 8, the Applicants have provided a positive recital of those features as noted in the marked-up version of the claims.

Although these amendments are made in response to a rejection under §112, the amendments are merely clarifying in nature, and should not in any way affect the scope of protection afforded the claims for infringement purposes, particularly, under the Doctrine of Equivalents.

Claims 1 and 2 are Not Anticipated by Saito

Claims 1 and 2 have been rejected under 35 U.S.C. §102(b) as being anticipated by Saito, U.S. Patent No. 5,528,697 (Saito).

The Applicants respectfully traverse the rejection. The Examiner is reminded that in order to form a proper anticipation rejection under 35 U.S.C. § 102, the reference must disclose each and every element of the claimed invention. *See* M.P.E.P. § 2131; *Verdegaal Bros. v. Union Oil Co. of Cal.*, 814 F.2d 628, 631 (Fed. Cir. 1987); *Scripps Clinic & Res. Found. V. Genentech, Inc.*, 927 F.2d 1565, 1576 (Fed. Cir. 1991); *In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997); *Glaxo Inc. v. Novopharm Ltd.*, 52 F.3d 1043, 1047 (Fed. Cir. 1995). Specifically, two conditions must be met as follows: (1) all the elements of the claim must be properly construed, and (2) all the elements of the claim, as properly construed, must be disclosed in the prior art reference either explicitly or inherently. *Elmer v. ICC Fabricating, Inc.*, 67 F.3d 1571, 1574 (Fed. Cir. 1995); *Schreiber*, 128 F.3d at 1477; *Glaxo*, 52 F.3d at 1047.

Claim 1 of the present invention recites the structural limitation of a radially oriented magnet. This magnet is shaped as a ring and its north pole is located on the inner periphery of the ring, while the south pole is located on the outer periphery of the ring in order to produce a magnetic circuit radiating between the two poles (see p. 4, lines 18-24 of the specification). As recited in claim 1, “the magnet is radially arrayed and positioned with its north and south poles parallel to the diaphragm and the vibration plate.” This structure makes it possible to suppress leakage of the magnetic flux in the direction of vibration of the diaphragm 11 and vibration plate 22.

In contrast, the Saito magnet 28 is oriented with a north-south axis oriented perpendicular to the diaphragm 24. Saito does not teach or suggest changing the north-south axis to that of the present invention.

Claim 2 of the present invention recites the structural feature of a double-suspension structure formed of two vibration plates 22 and 23. This structure has the advantageous benefit of enhancing magnetic shielding making it possible to suppress leakage of magnetic flux. Furthermore, because vibration resistance is improved, it is possible to maintain initial vibration characteristics.

Saito does not disclose all the elements of the claim either explicitly or inherently; therefore, the Examiner has not formed a proper anticipation rejection under 35 U.S.C. § 102. The Applicants respectfully request that the rejection be withdrawn.

Claim 3 is Patentable over Saito and Carlson

Claim 3 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Saito in view of Carlson, U.S. Patent No. 4,956,868 (Carlson).

It should be noted that three criteria must be met to establish a *prima facie* case of obviousness. *M.P.E.P.* § 2143. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings to achieve the claimed invention. *Id.* Second, there must be a reasonable expectation of success. *In re Rhinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976). Third, the prior art must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

The Applicants respectfully contend that the Examiner has failed to set forth a *prima facie* case of obviousness. The prior art does not teach or suggest all the elements of the claims, either explicitly or inherently. Please incorporate by reference the arguments *supra* with respect to the deficiencies of Saito. Saito does not disclose a magnet which is radially arrayed and positioned with its north and south poles parallel to the diaphragm and the vibration plate. Carlson does not correct the deficiencies in Saito. The Examiner cites Carlson in order to teach magnetic shielding (p. 5, Paper No. 10). Neither Saito, nor Saito in view of Carlson teaches or

suggests a magnet which is radially arrayed and positioned with its north and south poles parallel to the diaphragm and the vibration plate.

With respect to the Carlson reference, it is necessary to establish the joint or seam 43 between casing halves 23a and 23b in close proximity to the plane of shield joint 43. Furthermore, the shield joint 43 must be parallel to and in close proximity to the plane of magnetic symmetry P. This structure effectuates the reduction of magnetic leakage. In contrast, the present invention discloses a cover plate 31 that covers the upper side of the basket body 30. In order to suppress the external leakage of magnetic flux while keeping the size of the electro-magnetic actuator small, cover plate 31 is provided to suppress the external leakage of magnetic flux. Additionally, because a characteristic of the present electro-magnetic actuator is to perform as a sound generator, it is necessary to keep sound out while suppressing the external leakage of magnetic flux. Accordingly, sound holes 31a, 31b are provided on cover plate 31 of the present invention in order to keep sound out.

The Applicants further contend that even assuming, *arguendo*, that the combination of Saito and Carlson is proper, there is a lack of suggestion as to why a skilled artisan would use the proposed modifications to achieve the unobvious advantages first recognized by the Applicants. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990).

For the reasons stated above, the Examiner has failed to set forth a *prima facie* case of obviousness; therefore, the Applicants respectfully request that the Examiner withdraw the § 103 rejections.

Claims 8-10 are Patentable over Saito

Claims 8-10 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Saito. Please incorporate by reference the arguments above with respect to the deficiencies in Saito.

In addition to the above argument with respect to the axis and orientation of the magnet, the Applicants further submit that Saito does not disclose an elastic piece. The elastic piece 33 of the present invention holds vibration plates 22 and 23 and supports the plates inside of basket body 30. This structural feature improves impact resistance. This structural feature also buffers

any potential impact force. In the event that a user drops the portable electronic equipment in which the electro-magnetic actuator is mounted, the structure of the present invention directs impact force from the sound vibrator 2 into the elastic piece 33. Additionally, because the protrusion 33b is in contact with the outer edge of the magnet yoke 11, if the second vibrator 2 is shaken sideways on impact, the protrusion 33b acts as a stopper against the outer edge of the yoke 11, thus preventing distortion of the vibration plate 22, 23. Therefore, it is possible to provide improved impact resistance such that the electro-magnetic actuator is not broken.

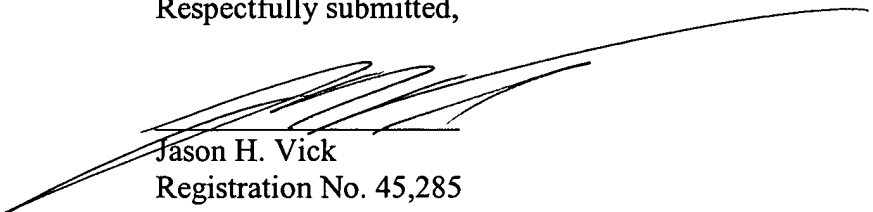
Also, the coil is supported by projection 11a of diaphragm 11. Accordingly, no other support member is needed to hold the coil 10 of the present invention, and so it is possible to reduce the number of parts and to mount the coil 10 easily. Moreover, it is possible for this vibrating portion 11b to maintain good frequency characteristics, unaffected by having the coil 10 mounted to it.

Again, Saito does not teach or suggest all the elements of the claims, either explicitly or inherently. For the reasons stated above, the Examiner has failed to set forth a *prima facie* case of obviousness; therefore, the Applicants respectfully request that the Examiner withdraw the § 103 rejections.

Conclusion

Having responded to all rejections set forth in the outstanding non-final Office Action, it is submitted that the claims are now in condition for allowance. An early and favorable Notice of Allowance is respectfully solicited. In the event that the Examiner is of the opinion that a brief telephone or personal interview will facilitate allowance of one or more of the above claims, the Examiner is courteously requested to contact Applicants' undersigned representative.

Respectfully submitted,



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MARKED-UP VERSION OF THE
AMENDMENTS TO THE SPECIFICATION

Page 3, paragraph 10, delete and replace with the following:

--Figure [8] 9 is a graph showing the frequency characteristics of the mounting structure of the electromagnetic actuator with the elastic packing of figure 7.--

Page, 4, paragraph 2, delete and replace with the following:

--Because of the structure of the first vibrator 1, no other support member is needed to hold the coil 10 in place, and so it is possible to reduce the number of parts and also to mount the coil 10 easily. Moreover, because the coil 10 is fixed to the projection 11a that projects from the surface of the vibrating portion [11a] 11b, it is possible for this vibrating portion 11b to maintain good frequency characteristics, unaffected by having the coil 10 mounted.--



MARKED-UP VERSION
OF THE AMENDED CLAIMS

1. (Amended) An electromagnetic actuator having a coil on which current is [impressed] applied, a magnet that forms a magnetic circuit between its poles across a magnetic gap with a magnet yoke, a diaphragm that vibrates by magnetic action when a high-frequency current is [impressed] applied and a vibration plate that vibrates by magnetic action when a low-frequency current is [impressed] applied, with the coil positioned within the magnetic gap and the [parts thereof being] coil, the magnet, the magnet yoke, the diaphragm, and the vibration plate are accommodated in a basket, in which the magnet is radially arrayed and positioned with its north and south poles parallel to the diaphragm and the vibration plate.

3. (Amended) An electromagnetic actuator as described in claim 1 or 2 above, in which [the] a cover of the basket is used as magnetic shielding.

8. (Amended) An electromagnetic actuator having a coil on which current is [impressed] applied, a magnet that forms a magnetic circuit between its poles across a magnetic gap with a magnet yoke, a diaphragm that vibrates by magnetic action when a high-frequency current is [impressed] applied and a vibration plate that vibrates by magnetic action when a low-frequency current is [impressed] applied with the coil positioned within the magnetic gap and the [parts thereof being] coil, the magnet, the magnet yoke, the diaphragm, and the vibration plate are accommodated in a basket, in which the vibration plate, is supported within the basket by an elastic piece that presses against the surface of [the] an outer rim of the vibration plate.

10. (Amended) An electromagnetic actuator having a coil on which current is [impressed] applied, a magnet that forms a magnetic circuit between its poles across a magnetic gap with a magnet yoke, a diaphragm that vibrates by magnetic action when a high-frequency current is [impressed] applied and a vibration plate that vibrates by magnetic action when a low-frequency current is [impressed] applied, with the coil positioned within the magnetic gap and the [parts thereof being] coil, the magnet, the magnet yoke, the diaphragm, and the vibration

plate are accommodated in a basket, in which the coil is supported by a concentric projection that projects from the surface of the vibrating portion, and there is a diaphragm within the basket.